

Fall 2021

PHYS 102-101: General Physics

Robert Duffin

Follow this and additional works at: <https://digitalcommons.njit.edu/phys-syllabi>

Recommended Citation

Duffin, Robert, "PHYS 102-101: General Physics" (2021). *Physics Syllabi*. 420.
<https://digitalcommons.njit.edu/phys-syllabi/420>

This Syllabus is brought to you for free and open access by the NJIT Syllabi at Digital Commons @ NJIT. It has been accepted for inclusion in Physics Syllabi by an authorized administrator of Digital Commons @ NJIT. For more information, please contact digitalcommons@njit.edu.

General Physics
PHYS 102, Section 101
CRN 94945
Fall 2021

September 7, 2021

Prof. Robert Duffin
rduffin@njit.edu

Lecture and recitation for Section 101:
Tuesday 6pm – 8:50pm, TIER 106 (sit on seats with **BLUE DOTS**)

Office Location: TIER 323

Office Hours: TR 9-9:30 am. Email me a question or email me for online appointment.

Course website: On Canvas. Login in through <https://canvas.njit.edu/>

Pre- and Co-requisite Courses

Prerequisite: Satisfactory completion of two high school mathematics courses and two high school science courses.

Laboratory - PHYS 102A

The laboratory component of the course is PHYS 102A. This laboratory course may be optional for your major; confirm it with your department. The grading for the laboratory is separate from the course/recitation (PHYS 102) and the grades are given by the laboratory instructors. Please contact PHYS 102A instructors for the course information. Latest edition of Lab manual "Physics 102A Laboratory Manual" can be purchased from NJIT Bookstore.

Please contact PHYS 102A instructors for further information.

Course Materials

Textbook: Physics - Principles with Applications, 7th ed. by Giancoli (Publisher: Pearson)
Students may purchase e-textbook along with the access to the Mastering Physics Online Homework system. Or, students may buy a physical textbook, for example, from NJIT bookstore. Mastering Physics Online Homework System:

Course Name: PHYS102 Section 101

Course ID: duffin47651

Course Type: Student Course

Course Dates: Sep 06, 2021 - Dec 31, 2021

You can buy the Mastering Physics student access code online. If you buy a physical textbook, you may buy the physical textbook bundled with a Mastering Physics student access code card. Homework assignments will be posted on-line. Students login, download and solve the assigned problems, and submit answers to the automated grading system. To enroll for this section of the course, use course ID "duffin47651".

Email:

NJIT email will be routinely used for announcements and to distribute material. Be sure check the NJIT email every day. Only email me from your NJIT email account so that I can reply to you

Computer:

Students are required to have access to a computer with high speed internet connection.

Canvas:

Canvas is used for the main course website. Login through <https://canvas.njit.edu/>

Attendance

Attendance at lectures and recitations is mandatory; it may constitute a portion of the final grade. Missing more than three lectures will be reported to the Dean of Freshman Studies throughout the semester and can result in failing the course. Students with absences need to discuss their extenuating circumstances for missing the classes with the Dean.

Exams

There will be two midterm Exams and one Final Exam during the term. The exam schedule is:

Exam 1: Tuesday, September, 4:15pm – 5:45pm

Exam 2: Tuesday, September, 4:15pm – 5:45pm

Final Exam: To be announced

There will be no makeup exams.

Grading

Final grades will be based on a composite score for the term's work that includes Exam 1, Exam 2, Final exam, Mastering Physics Homework and class participation. The approximate weights we expect to use in calculating the composite score are:

- 25 % for Exam 1
- 25 % for Exam 2
- 30 % for Final Exam
- 15 % for Homework grade
- 5 % for Class participation

Credit will be given for active class participation, etc. Negative credit may be applied for lateness, creating noise, or otherwise interfering with class work.

The cutoff percentages for various letter grades will be in the range of

84.0% for A,

76.0 % for B+,

68.0% for B,

60.0% for C+,

52.0% for C,

44.0% for D,

F below 44.0 %.

C or better grade is required to take further physics courses. If you get D in Physics 102, you cannot take the next level physics course.

Reading Assignments

You should read assigned reading sections of the text before the lecture covering that material.

Homework

It is almost impossible to succeed in this course without working lot's of problems: do homework

Each student must download the weekly homework assignments from Mastering Physics online homework system, work the problems, and submit the solutions online before each assignment is due. Late work will not be accepted. See Course Materials section above.

Honor Code Violations or Disruptive Behavior

NJIT has a zero-tolerance policy for cheating of any kind and for student behavior that disrupts learning by others. Incidents will be immediately reported to the Dean of Students. The penalties for violations range from failure in the course with disciplinary probation, to expulsion from NJIT. Avoid situations where your own behavior could be misinterpreted, even if it is honorable. Students are required to agree to the NJIT Honor Code on each exam. Turn off all cellular phones, wireless devices, computers, and messaging devices of all kinds during exams.

Help: Students are encouraged to meet with their instructor during their office hour. Physics Department also offers tutoring as will be posted on <http://physics.njit.edu/>.

Learning Outcomes: You can expect to be assessed on the following learning outcomes:

1. Recall the definitions and relationships involving position, velocity, speed, acceleration, vectors, Newton's Laws, circular motion, free-body diagrams, friction, work, energy, linear and angular momentum, torque, angular velocity and acceleration, and gravitation.
2. Apply the equations governing 1-D and 2-D constant acceleration to mechanical systems for various initial conditions. Calculate unknown quantities based on physical relationships, initial conditions, and known quantities.
3. Comprehend the meaning of the equations governing net force and acceleration (Newton's Laws), and be able to manipulate them in conjunction with a free-body diagram to obtain any desired quantitative relationship. Understand the extension of these equations to rotational motion, and gravitation.
4. Generalize the concepts underlying the equations of motion, such as work, kinetic and potential energy, conservation of energy, and equilibrium.
5. Comprehend the meaning of equations governing momentum, impulse, and collisions. Apply the equations governing momentum, impulse, and collisions mechanical systems for various initial conditions. Understand under what conditions momentum is conserved and how to use this relation to calculate unknown quantities based on physical relationships, initial conditions, and known quantities.
6. Understand the extension of linear motion equations to rotational motion. Comprehend the meaning of the equations governing rotational motion and acceleration, and be able to manipulate them in conjunction with a free-body diagram to obtain any desired quantitative relationship.

2021 Fall Course Schedule for PHYS 102 – Section 101

Dates	Lecture Topics	Reading
T Sep 7	Math Review	A4, Chapter 1: sections 1 to 6
T Sep 14	Motion in 1D (One Dimension)	Chapter 2: Section 1 to 8
T Sep 21	Vectors, 2D Motion	Chapter 3: Section 1 to 6
T Sep 28	Laws of Motion, Forces, Newton's Laws	Chapter 4: Section 1 to 5
T Oct 5	Exam1 (Ch.1- 3.4)	
T Oct 12	Laws of Motion, Application of Newton's Laws	Chapter 4: Section 6 to 8
T Oct 19	Circular Motion, Energy, Work, Kinetic Energy, Work-Energy Theorem	Chapter 5: Section 1, 2, 4 (excluding highway curves) Chapter 6: Section 1, 3
T Oct 26	Energy, Potential Energy, Mechanical Energy, Energy Conservation, Power	Chapter 6: Section 4 to 7, 9, 10 (excluding spring)
T Nov 2	Exam2 (3.5, 3.6, Ch.4, Ch.5.1, 2, 4)	
T Nov 9	Momentum and collisions, momentum, impulse, conservation of momentum, collisions	Chapter 7: Section 1 to 8, 10
T Nov 16	Rotational Motion, Rotational Dynamics I	Chapter 8: Section 1 to 3
T Nov 23	Rotational Dynamics II	Chapter 8: Section 4 to 8
T Nov 30	Static Equilibrium The Law of Gravity	Chapter 9: Section 1 to 4 Chapter 5: Section 5 to 7 (excluding Kepler's laws)
T Dec 7	Review	
Dec 13-14	Reading Days	
Dec 15-21	Final Exam TBD (Comprehensive)	

Date to be announced Final Exam Everything learned in class

* The professor will discuss changes to the syllabus during class if they arise.